

AUSTRALIAN PYRGOTIDAE (DIPTERA).

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With an Appendix by J. R. MALLOCH.

(Fourteen Text-figures.)

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The Pyrgotidae, formerly regarded as a subfamily of the Ortalidae, are now separated as a distinct family of the Ortalidiformes series, or of the Tephritomorphae group. This last group is distinguished chiefly by the divergent, never convergent, postvertical bristles, and the strongly chitinized, and well developed, ovipositor of the females.

The principal characters of the Pyrgotidae are as follows: Ocelli often lacking; lunule not exposed; prelabrum small; no propleural bristle, but prothoracic hairs or bristles usually present; only three supra-alar bristles; squamulae small; penis spiral; tibiae without preapical dorsal bristle; first longitudinal wing vein hairy or bristly; third vein as a rule bare at base; lower angle of anal cell acute, and usually produced. The most conspicuous feature is the exceptionally developed ovipositor, which is conical or cylindrical, greatly swollen at base, very often as long as the remainder of abdomen, which in the female has six visible segments.

The Pyrgotidae are conspicuous flies, of large or medium size, rarely small; they are always of pale yellowish colour, or reddish, and very often have variegated wings. These pale colours are certainly related to the nocturnal habits of most of the species. Specimens caught at light are frequently met with in collections, as has been several times recorded, and Mr. H. K. Munro of East London, Transvaal, informs me that in South Africa Pyrgotidae are almost exclusively taken at light. The reduction of the eyes and lack of ocelli in many species are perhaps due to these habits.

The food of the adult flies is unknown, but they certainly do not feed on flowers; some species may be predacious, like the equally yellow and nocturnal *Bengalia*, etc., but they have more fleshy soft proboscides.

Where the larvae are known they are endoparasitic upon lamellicorn beetles of nocturnal habits, first discovered in North America, where they parasitize the genus *Phyllophaga*, and more recently they have been recorded as attacking the Javanese species *Adoretus compressus*, by Dr. de Meijere. The well developed, and often tuberculate, ovipositor is apparently adapted to the peculiar method of oviposition, or possibly of larviposition, in the host, and the coxae sometimes bear tufts of small spines, similar to those present in some Tachinidae.

The Pyrgotidae are evidently allied to the Conopidae, as evidenced by the shape of the head, abdomen, and legs, etc., and by the endophagous habits of the larvae, living in the bodies of living insects, those of the former in Coleoptera, and those of the latter in Hymenoptera. This affinity was pointed out by de Meijere, and more recently by Malloch.

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\* At the time of Professor Bezzi's death the manuscript of this paper was not in shape to send to the press and it was prepared by Mr. J. R. Malloch so that the work of the author might not be lost.



The family is not a large one in point of number of species, but is present in all the zoological regions. The flies are very rare in Europe (I have never met with them in more than 30 years' collecting), but they are rather frequently met with in North America, and seem to be rather plentiful in tropical and subtropical countries. I present below a complete list of the described species, but there are a number of new species (14) not in this list, which I have included in a paper dealing with the Ethiopian fauna.

*List of Described Species.*

1. *Toxura microps* Hendel, 1914, Sydney, N.S.W.
2. " *longipalpis* Hendel, 1908, Australia.
3. " *maculipennis* Macquart, 1850, Tasmania.
4. " *angustifrons* Hendel, 1914, Queensland.
5. " *variegata* Hendel, 1908, Australia.
6. *Epicerella guttipennis* Macquart, 1850, Tasmania.
7. " *miliacea* Hendel, 1914, Queensland.
8. " *punctulata* Hendel, 1914, W. Australia.
9. *Acropyrgota flavescens* Hendel, 1914, Australia.
10. *Trichellopsis tipuloides* Hendel, 1914, S. Africa.
11. " *muii* Hendel, 1914, S. Africa.
12. " *tephritoides* Hendel, 1914, Cape of Good Hope.
13. *Tephritopyrgota vesicatoria* Hendel, E. Africa.
14. " *stylata* Hendel, 1914, E. Africa.
15. " *belzebuth*, Hendel, 1914, E. Africa.
16. " *carbonaria* Hendel, 1914, S. Africa.
17. " *nubilipennis* van der Wulp, 1885, Central Africa.
18. " *passerina* Hendel, 1914, S. Africa.
19. " *abjecta* Adams, 1905, S. Africa.
20. " *hirsuta* Hendel, 1914, S. Africa.
21. " *tenuis* Hendel, 1914, S. Africa.
22. " ? *microcera* Portchinsky, 1892, Amur.
23. " ? *ferruginea* Walker, 1853, India.
24. *Pyrgota valida* Harris, 1867, N. America.
25. " *maculipennis* Macquart, 1846, N. America.
26. " *undata* Wiedemann, 1830, N. America.
27. " *pterophorina* Gerstaecker, 1860, N. America.
28. " *vespertilio* Gerstaecker, 1860, N. America.
29. " *filiola* Loew, 1876, N. America.
30. " *chagnoni* Johnson, 1900, N. America.
31. " *fenestrata* Macquart, 1850, America.
- 31a. " *lugens* van der Wulp, 1898, Guatemala.
32. " *longipes* Hendel, 1908, Brazil.
33. *Teretrura flaveola* Bigot, 1885, Chile.
34. *Adapsilia coarctata* Waga, 1842, Europe.
35. " *vagae* Bigot, 1880, Persia, Caucasus.
36. " *fusca* Hendel, 1914, Japan.
37. " *luteola* Coquillett, 1898, Japan.
38. " *omorii* Matsumura, 1916, Japan.
39. " *flavopilosa* Hendel, 1914, Japan.

40. *Adapsilia vulpina* Hendel, 1914, Sikkim.
41. „ *armipes* Hendel, 1914, Sikkim.
42. „ *opaca* Bezzi, 1914, Sikkim.
43. „ *nocturna* Bezzi, 1914, Sikkim.
44. „ *brahma* Hendel, 1914, S. India.
45. „ *scutellata* Hendel, 1914, N.W. India.
46. „ *trinotata* de Meijere, 1914, Java.
47. „ *magnicornis* Hendel, 1914, Ceylon.
48. „ *amplipennis* Bezzi, 1914, China.
49. „ *angustifrons* Bezzi, 1914, India.
50. „ *longina* Hendel, 1914, E. Africa.
51. „ *caffra* Hendel, 1914, Natal.
52. „ *ypsilon* Hendel, 1914, Sierra Leone.
53. „ *latipennis* Walker, 1849, W. Africa.
54. *Apyrgota scioida* Hendel, 1908, Molucca.
55. „ *pictiventris* Hendel, 1914, Ceylon, India.
56. „ *unicolor* Hendel, 1914, Ceylon.
57. „ *pubiseta* Hendel, 1914, Oriental Region.
58. „ *alienata* Walker, 1861, Ceram.
59. „ *marshalli* Hendel, 1914, Nyasaland.
60. „ ? *personata* Lutz and Lima, 1918, Brazil.
61. *Leptopyrgota amplipennis* Hendel, 1914, Bolivia.
62. „ *sahlbergiana* Frey, 1918, Brazil.
63. *Hypotyphla loewi* Hendel, 1908, S. Africa.
64. *Campylocera gracilis* Hendel, 1914, W. Africa.
65. „ *caudata* Hendel, 1914, W. Africa. [As a *Hypotyphla*.]
66. „ *piceiventris* Hendel, 1914, E. Africa.
67. „ *pleuratis* Hendel, 1914, E. Africa.
68. „ *myopa* Hendel, 1914, Nyasaland.
69. „ *nigriventris* Hendel, 1914, S. Africa.
70. „ *unicolor* Becker, 1909, E. Africa.
71. „ *maculifer* Hendel, 1914, S. Africa.
72. „ *angustigenis* Hendel, 1914, S. Africa.
73. „ *latigenis* Hendel, 1914, E. Africa.
74. „ *oculata* Hendel, 1914, E. Africa.
75. „ *ferruginea* Macquart, 1843, S. Africa.
76. „ *robusta* van der Wulp, 1880, Java, Sumatra.
77. „ *longicornis* van der Wulp, 1885, Java.
78. „ *myiopina* van der Wulp, 1880, Java.
79. „ *fuscipes* van der Wulp, 1885, Java.
80. „ *thoracalis* Hendel, 1914, Philippines.
81. „ *rufina* Bezzi, 1917, Philippines.
82. „ *brevicornis* Hendel, 1908, New Guinea.
83. *Prosyrogaster chelionotus* Rondani, 1875, Borneo.
84. *Diasteneura laticeps* Hendel, 1908, S. Africa.
85. *Tylotrypes immsi* Bezzi, 1914, India.
86. *Eumorphomyia tripunctata* Doleschall, 1859, Amboina.
87. *Geloemyia stylata* Hendel, 1908, Tonkin.
88. *Toxopyrgota inclinata* Hendel, 1917, E. Africa.

As will be seen from the preceding enumeration, the genera have a clearly limited geographical distribution; only one genus is common to the Old and New Worlds, that is *Apyrgota*, but the neotropical species (*personata*) may belong to a distinct genus. The few genera with a wide range are *Pyrgota* (nearctic and neotropical) and *Adapsilia* and *Campylocera* (all regions of the Old World).

The Australian Pyrgotidae are very peculiar. There are amongst them forms with ocelli and with broad pterostigma (*Toxura* and *Epicerella*), and forms with pointed third antennal segment (both the above-named genera and *Acropyrgota*). To these forms are added here some very aberrant species which are closely allied to the Myopine flies.\*

The material for the present monograph was received from the late Dr. E. W. Ferguson, Dr. J. F. Illingworth, and Mr. G. F. Hill, to whom my thanks are due.

The Australian genera may be distinguished as in the following key.

*Key to the Genera.*

- 1 (6). Ocelli well developed, and three in number; ocellar bristles lacking or rudimentary; third antennal segment usually with a sharp point at apex; pterostigma broad and long.
- 2 (3). Facial keel broad and flat, the antennae being concealed in the facial grooves; sternopleural and pteropleural bristles not distinct; mid tibiae without distinct spurs ..... 1. *Maenomenus*, nov. gen.
- 3 (2). Facial keel narrow and sharp, the antennae being free and exserted; sternopleural and pteropleural bristles well developed, sometimes very strong; mid tibiae with the usual terminal spurs.
- 4 (5). Three notopleural bristles present (1:2); basal abdominal segment not longer than second; face not prominent below the apices of antennae; ovipositor clothed with slender sparse hairs; wings banded or entirely hyaline, always destitute of small clear spots ..... 2. *Toxura* Macquart
- 5 (4). Only two notopleurals present (1:1); basal abdominal segment at least twice as long as second; face distinctly produced just below apices of antennae; ovipositor clothed with dense rigid hairs; wings with more or less numerous clear spots ..... 3. *Epicerella* Macquart
- 6 (1). Ocelli entirely lacking, but the ocellar bristles more or less developed; pterostigma very narrow, and usually short.
- 7 (12). Proboscis short and simple, shorter than the palpi; frons in both sexes as broad as, or only a little narrower than, one eye; apical section of fourth vein curved downward at end, the first posterior cell being thus widened at apex.
- 8 (11). Wings with the costal vein extending to apex of fourth vein, the latter complete to margin of wing; second vein with a strong stump.
- 9 (10). Third antennal segment pointed at apex; vertex without transverse keel; discal cell narrowed at base ..... 4. *Acropyrgota* Hendel
- 10 (9). Third antennal segment rounded at apex; vertex with a prominent transverse keel; discal cell not narrowed at base ..... 5. *Adapsilia* Waga
- 11 (8). Costal vein ending at third vein, and the fourth evanescent apically, or at least less distinct apically than basally; second vein without stump ..... 6. *Campylocera* Macquart
- 12 (7). Proboscis longer than the palpi, and distinctly geniculated; frons of the male much narrower than one eye; apical section of fourth vein straight, the first posterior cell with parallel sides ..... 7. *Prodalmania*, nov. gen.

1. MAENOMENUS, nov. gen.

This genus is the most aberrant of those provided with distinct ocelli; all the three genera with ocelli are peculiar to Australia, and are evidently the most ancestral forms in the entire family. This genus is likewise aberrant in possessing

\* In this connection it may be mentioned that in Kroeber's monograph of the Conopidae there are no Myopinae, Dalmanniinae, or Stylogasterinae, recorded from Australia.

a short basal abdominal segment, a character which it shares with *Toxura*, but differs from that genus, as well as from all others in the family, by lacking the terminal spurs on the mid tibia. The form of the head is very like that of the Myopinae, thus this genus and *Prodalmanina* represent two very evident connecting links between the Conopidae and Pyrgotidae. The general shape of the present genus is also not unlike that of some Chloropidae.

Body slender and elongate, with short bristles and sparse hairs; colour testaceous, with black stripes and spots. Head greatly developed, subquadrate in profile, shaped not unlike that of some Myopinae, occiput convex and rather swollen, with distinct lower swellings. Vertex slightly carinate, but the keel not prominent. Frons equally wide in both sexes, more than twice as wide as one eye, flat, in profile bluntly prominent in front; the middle stripe is extended to the eyes, the parafrontals being distinguishable only on sides of anterior half. Lunule small, concealed. Three well developed and approximated ocelli present. Eyes small, rounded, placed somewhat obliquely, bare, with small facets. Parafacials and peristomalia broad. Antennae short, widely separated at bases, inserted at level of the upper border of the eyes, rather concealed in the facial grooves; second segment with sparse hairs; third segment rounded at apex, without upper terminal point; arista basal, short, bare, thickened at base. Face broad, with a very broad and flat middle keel, the oral grooves widely separated, extending to lower level of eyes; mouth opening long and broad. Palpi dilated at apices, longer than the mouth, nearly bare; proboscis short and simple, concealed in the mouth. Cephalic bristles reduced to a single pair of rather short verticals, the other bristles not distinguishable, but traces of a short orbital on each side; hairs very scarce, even in front of middle stripe. Mesonotum elongate, with the transverse suture broadly interrupted in middle; bristles rather weak, one humeral, two notopleurals, one presutural, two posterior supra-alars, one pair of dorsocentrals, one mesopleural, and the propleural tuft well developed. Scutellum small, short, convex, with four to six marginal bristles. Abdomen slender, parallel-sided, not at all constricted at base, a little longer than thorax; in the male there are five visible segments, and in the female six; basal segment not at all elongated, shorter than the second; male genitalia rounded, not visible from above; ovipositor very long, about as long as entire body, much swollen at base. Legs stouter in the male than in the female, in both sexes nearly bare, with very short hairs even on the femora; mid tibia without distinct apical spurs; preapical bristle present only on fore tibia, but inconspicuous; tibiae not longer than their femora, only those of the hind pair being a little elongate in the female; tarsi short in the male, longer in the female, rather broad at apices. Wings long and narrow; costa produced to apex of fourth vein and nearly bare, even at base. Auxiliary vein thick and entire, ending at an acute angle with costa; first vein ciliated throughout its length, ending beyond middle of wing, but slightly before level of inner cross-vein, the latter placed very close to the outer cross-vein; second vein straight and without stump; third vein straight, bare at base, ending near the tip of wing; apical section of fourth vein complete, slightly curved to the middle; discal cell long, its lower terminal angle being very near the hind border of the wing; outer cross-vein straight, perpendicular, considerably longer than its distance from inner one; anal cell broad outwardly, its lower angle small, acute, distinctly but not very much produced; sixth vein strong, extending to margin of wing, subobsolete at apex. Axillary lobe and alula well developed, much longer than broad; spurious axillary vein long.

Type, the following species.

## MAENOMENUS ENSIFER, n. sp.

A strikingly characterized species, with a brown costal border and a broadly infuscated outer cross-vein to the wings.

Type, male, and allotype, in Health Dept. collection, the male from Manly, 6.xii.1923, the female from Sydney, 20.xi.1921, E. W. Ferguson.

Male and female.—Length of body and wing, 7 mm., of ovipositor, 6 mm.

Head entirely testaceous, opaque, shining only on sides of occiput and near the vertex. The occiput has four oblique black stripes above, two on each side, radiating from the centre, but not reaching the sides, the outer ones ending near middle of eyes, the inner ones near upper angle of eyes. There is also a rounded black ocellar spot. Frons dull reddish, with a narrow black middle line extending from the ocellar spot to lunule; parafacials and cheeks reddish, unspotted, with sericeous reflections. Antennae entirely reddish-yellow. Face reddish, with a broad deep black rounded spot on the middle of supraoral plate. Palpi and proboscis yellowish. Vertical bristles black; the very sparse hairs are dark, but on lower part of head there are a few longer pale hairs. Mesonotum testaceous, slightly shining, with four narrow black stripes which are abbreviated in front and confluent behind, but the two middle ones are often linear or wanting in the male; a narrow black stripe runs along the notopleural suture from the humeri to the base of wing, and just above the root of the wing there is also a short black stripe, while behind the root there is a rounded black spot. Pleura more yellowish, and rather shining; a narrow black stripe running parallel to the notopleural suture and extending from the propleural tuft to the middle of mesopleura; sternopleura shining black; a rounded shining black hypopleural spot, and below this a deep black spot just above the hind coxa; mesophragma shining black, with a reddish line along the middle in the male. Bristles black; hairs black, very sparse and short, even on the pleura. Scutellum shining reddish, with two black stripes above in continuation of those on mesonotum. Halteres pale yellowish. Abdomen testaceous, rather shining, with two narrow parallel black stripes on middle of back extending from the second segment to the tip in the female, but present only on second and third segment in the male; in addition the side margins are each marked with a narrow line; venter reddish-yellow, unspotted; hairs and bristles black. Male genitalia shining reddish; ovipositor shining black, quite bare. Legs entirely yellowish to apices of tarsi, unspotted; the very short and sparse hairs are all black, being longer and more numerous in the male. Wings whitish hyaline, with black, rather thick, veins which are reddish towards the base. The brown pattern is formed by a broad costal border, which does not extend below the third vein except at apex, where it reaches the middle of the first posterior cell; this dark border is more yellowish in the costal cells and along the submarginal cell, but is darker at the apex; the stigma is black in the male and pale in the female. In addition the outer cross-vein is broadly margined with fuscous, forming an oblique band extending from hind margin of wing to the fourth vein. The inner cross-vein is not, or very slightly, margined with fuscous, and is situated near the apex of discal cell, being about as long as, or longer than, its distance from hind one.

## 2. TOXURA Macquart, 1850.

This is a typical Australian genus. It is very distinct from all the other known genera of the family on account of the three notopleural bristles, the two posterior ones being of about equal size and placed one above the other; in addition the

short basal segment of abdomen is also characteristic. I have seen only two species, and therefore I can not say if these characters are also present in all the known species; but as the three notopleurals were specifically mentioned by Hendel in his generic description in 1908, I think that the character is common to all the species described by him, notwithstanding that he differentiated the genus from *Epicerella* only by the wing pattern in his paper in 1914.

The species known to me may be distinguished as follows:

- 1 (4). Wings wholly hyaline, quite unspotted.
- 2 (3). No postvertical bristles; cheek broader than the vertical diameter of eye; wings greyish only at base, and yellowish near costa ..... *microps* Hendel
- 3 (2). Postvertical bristles present; cheek only one-half as broad as the vertical diameter of eye; wings wholly yellowish, more intensely so on costa .....  
..... *longipalpis* Hendel
- 4 (1). Wings with fuscous bands or with fuscous spots.
- 5 (6). Frons only one-half as broad as one eye; no postverticals; antennae black; wings banded, with two fuscous bands and two or three hyaline spots ....  
..... *angustifrons* Hendel
- 6 (5). Frons as broad as, or broader than, one eye.
- 7 (10). Wings with two broad dark bands, which are not interrupted by hyaline spots.
- 8 (9). No postverticals; third antennal segment reddish-yellow; mesonotum pale brown; intermediate pair of scutellar bristles sometimes wanting; only one strong mesopleural bristle present ..... *variegata* Hendel
- 9 (8). Postverticals present; third antennal segment black; mesonotum largely black; scutellum with six strong bristles; two strong mesopleurals present .....  
..... *robusta*, n. sp.
- 10 (7). Wings not banded, with fuscous spots only.
- 11 (12). Inner cross-vein not margined with fuscous ..... *maculipennis* Macquart
- 12 (11). Inner cross-vein broadly margined with fuscous ..... *discoidalis*, n. sp.

#### TOXURA MICROPS Hendel.

*Arch. f. Naturgesch.*, 1914, p. 115, fig. 15.

A smallish species (5 mm.), very distinct from the other known species on account of its very small eyes.

Described in both sexes from Sydney, N.S.W., and from Moreton Bay. Types in the British Museum; not seen.

#### TOXURA LONGIPALPIS Hendel.

*Wien. entom. Zeit.*, 1908, p. 147; *Gen. Ins.*, 1908, pl. 1, fig. 24, 25.

A little larger than the preceding species (7.5 mm.), and distinguished by the larger eyes and long palpi.

Described from the female. Locality, Sydney. Type in Vienna Museum. Not seen.

#### TOXURA ANGUSTIFRONS Hendel.

*Arch. f. Naturgesch.*, 1914, p. 116.

Close to the following species and with a similar wing pattern, but distinguished by the narrower frons, and the black antennae. The fuscous bands on the wings have some hyaline spots in them as in *Epicerella plagiata*, and the species may belong to that genus.

Described from the female only. Locality Burpengary, S. Queensland. Type in the British Museum. Not seen.

#### TOXURA VARIEGATA Hendel.

*Wien entom. Zeit.*, 1908, p. 148; *Gen. Ins.*, 1908, pl. 1, fig. 22, 23.

A very distinct species on account of the two broad dark bands on the wing, which are not at all interrupted by hyaline spots; antennae reddish.

Described from a male taken in North Queensland. Type in Vienna Museum. I have seen one male specimen from New South Wales, Overland Corner, December 2, 1913 (E. W. Ferguson). This specimen has only four scutellar bristles, the intermediate pair being indistinguishable. In addition the ocellar bristles are not evident, the eyes seem to be more rounded, but in other respects it agrees with the description.

*TOXURA ROBUSTA*, n. sp.

Closely related to the preceding species, but more robust, much darker in colour, and having better developed bristles.

Type male, a specimen from Victoria, Warburton, January 13, 1924 (F. E. Wilson).

Male.—Length of body and wing about 10 mm. Head as described and figured by Hendel for *variegata*. The occiput is, however, darker, being blackened on its upper portion; the chaetotaxy is the same, but there is a well developed pair of postvertical bristles present; the ocellars are short and fine; median frontal stripe very dark reddish-brown, almost blackened on anterior portion; eyes rounded, about as high as long; third antennal segment black, rounded at apex, without prominent acute point; parafacials narrower than in *variegata*, reddish-brown below; peristomalium a little narrower, unspotted, but narrowly reddish-brown along lower border of eyes; supraoral plate shorter, margined with black above; face whitish. Mesonotum almost entirely black on disc, reddish-brown in front, with pale yellowish humeri; notopleural region and supra-alar stripe yellowish; on centre of mesonotum there is a greyish vitta, but there is no distinct division of the black portion into four vittae; pleura reddish or yellowish, with broad blackish-brown patches; the mesopleura is black, with yellowish upper border. Scutellum black above, pale yellowish on sides and below; postscutellum and mesophragma shining reddish-brown. Hairs and bristles black; chaetotaxy as in *marginata*, but better developed, the intermediate pair of scutellar bristles as strong as the others; scutellum more haired above; two strong bristles and a series of bristly hairs on the mesopleura; pteropleural and sternopleural hairs very strong. Halteres pale yellowish. Abdomen dark reddish-brown, the tergites blackened centrally or basally; all the segments of about equal length, only the apical segment being evidently elongated; hairs and bristles black; venter opaque blackish, the dorsum rather shining. Legs as in *variegata*, but all femora more broadly and intensely blackened. Wings with venation and pattern as in *variegata*, the whitish hyaline band between the two dark bands on fore border is broad, and without dark clouds or stripes, and the hind cross-vein is broadly margined with fuscous.

*TOXURA MACULIPENNIS* Macquart.

*Mem. Soc. Sci. Lille*, 1851, p. 263, pl. 26, fig. 18 (p. 289 of reprint).

Distinguished by the simple wing pattern, which consists only of an abbreviated narrow dark band below the stigma extending to the inner cross-vein, and another narrow preapical dark band from costa at apex of second vein extending to middle of apical section of fourth vein.

Described from a female specimen taken in Tasmania. Type in Paris Museum. Not seen.

*Urophora testacea* Macquart (*l.c.*, 1851, p. 260 (286) pl. 26, fig. 12) seems to be a *Toxura* very like *maculipennis*, differing only in having a black stripe on the



sides of mesonotum, and a somewhat different wing pattern, which latter is, however, of the same type.

*TOXURA DISCOIDALIS*, n. sp.

Allied to the preceding species, but distinguished from it by having the inner cross-vein of wing broadly margined with fuscous.

Type female, in the Health Dept. collection, from Milson Is., October 31, 1914.

Female.—Length of body, including ovipositor, 10 mm., of wing, 9.5 mm.; wing spread, 22 mm.

Occiput flat above, with less prominent lateral swellings below, reddish on upper half, blackened towards the upper border of eyes and vertex, and pale yellowish below on sides, and there clothed with scattered fine pale hairs. Frons comparatively narrow, distinctly narrower than one eye, and about twice as long as wide; at vertex there is no prominent keel, opaque reddish-brown on central stripe which is clothed with rather long dark hairs, and is whitish-yellow on sides; in profile the frons is protruded in front not more than as far as width of third antennal segment, and on the projecting portion clothed with short dark hairs. Three distinct ocelli present, placed very close together on a small triangle which bears two pairs of short black bristles. Antennae short, reddish, with the third segment darkened; second segment a little shorter than third, with short black hairs, third segment oval, attenuated at apex, but not exactly pointed; arista twice as long as antenna, slender, bare, thickened at base, with distinct basal segment. Face entirely flat, narrower than one eye, not at all prominent above the mouth border, antennal grooves separated by a keel extending to lower margin of eyes, entirely yellowish, shining only in the grooves; parafacials opaque yellowish, narrow, half as wide as third antennal segment, haired only above; peristomalium opaque yellowish, unspotted, bare, about one-third as high as vertical diameter of eye. Eyes bare, oval, their vertical diameter twice as great as their horizontal, the middle anterior facets enlarged. Palpi broad, spatulate, reddish, devoid of bristles and hairs; proboscis shorter than the palpi, dirty yellowish, comparatively small, even the mouth opening being rather small. Bristles black, two pairs of verticals, and some short bristles along the upper eye border; postverticals and ocellars small; two pairs of orbitals which are long and erect, curved outwardly. Thorax shining reddish-brown, with pale yellowish humeri and sides of mesonotum, dorsum clothed with short black pubescence, with faint whitish dust, and with four faint dark vittae. Bristles long and strong, black, one humeral, three notopleurals (1:2), one presutural, one anterior supra-alar, two posterior supra-alar, one dorsocentral, two prescutellars, two mesopleural, one pteropleural, and one sternopleural amongst long rigid hairs; propleural bristles numerous; mesopleura clothed with black hairs. Scutellum reddish, less shining than mesonotum, with short black hairs and six strong bristles. Below the postalar ridge, near the base of wing, there is a small rounded black spot; mesophragma shining reddish-brown; halteres pale yellowish; squamulae whitish, with short fringe of soft pale hairs. Abdomen reddish, slightly shining, with short black pubescence and black bristles at sides and behind; first segment not at all narrowed at base, short, but little longer than second segment; ovipositor about as long as the remainder of abdomen, conical, shining reddish-brown, clothed with very few fine black hairs, and provided below towards the middle with a tuft of six or seven strong short black spines.

Venter blackish, opaque, nearly bare. Legs short and stout, entirely reddish, unspotted; coxae with black bristles; femora with distinct rows of bristles; tibiae simple; apical segment of all tarsi dilated. Wings comparatively narrow and long; auxiliary vein broken at right angles at apex; stigma broad, about three times as long as wide, yellowish, unspotted; second vein straight, devoid of stump; third vein with two or three short bristles at extreme base, its apical section gently curved downward, ending a little before wing tip; costa ending at fourth vein; apical section very fine; last portion of fourth vein complete, regularly curved, the second posterior cell dilated above towards middle; inner cross-vein placed beyond the middle of discal cell; outer cross-vein straight and perpendicular, a little shorter than its distance from inner cross-vein; lower angle of anal cell acute, and considerably produced; sixth vein distinct only at extreme base, sub-obsolete apically, but extending to margin of wing. The wings are greyish hyaline, a little yellowish at base and along costa; the most conspicuous dark mark is the broad clouding over the inner cross-vein in the middle of the wing; there is a dark spot at base of third vein, a less distinct fuscous cloud in the apices of marginal, sub-marginal, and first posterior cells beyond the outer cross-vein, the latter very faintly infuscated.

### 3. EPICERELLA Macquart, 1850.

Hendel, *Gen. Ins.*, Pyrgotinae, 1908, p. 25.

This genus is also characteristic of the Australian fauna. It is less aberrant than the last preceding one, having but two notopleural bristles, and the basal abdominal segment more elongate, and distinctly constricted at base. The third antennal segment may, or may not, be acute at apex. The wings of the several species are as narrow as in *Toxura*, and have a very similar pattern, but always have rounded hyaline spots in the dark portions. The species with the more punctate wings have also the wings very broad. The second wing vein has often a stump, which is absent in all the species of *Toxura*. The facial prominence just below the tips of antennae is also characteristic.

The species may be distinguished as in the following key:

- 1 (4). Wings comparatively narrow, more banded than spotted; pterostigma fuscous, always destitute of hyaline spots; second vein without stump.
- 2 (3). Two pairs of dorsocentrals; one upper orbital; wings with an extensive dark pattern, forming distinct fasciae ..... *plagiata*, n. sp.
- 3 (2). Four pairs of dorsocentrals; two upper orbitals; wings with more reduced dark pattern, not fasciate ..... *setosa*, n. sp.
- 4 (1). Wings broader, not distinctly banded, with numerous hyaline spots; pterostigma with 1-3 hyaline spots; second vein usually with a stump.
- 5 (6). Species of very large size (19 mm.), with 10-12 bristles on hind margin of scutellum; third antennal segment pointed at apex; second vein with stump ..... *punctulata* Hendel
- 6 (5). Smaller species, not more than 11 mm. in length; scutellum with but four bristles.
- 7 (8). Pterostigma with only one hyaline spot in the middle; second vein without a stump ..... *guttipennis* Macquart
- 8 (7). Stigma with more than one hyaline spot.
- 9 (10). Peristomalium barbate; pterostigma with three hyaline spots; third antennal segment attenuated at apex; no yellow hypopleural spot; second vein with a stump ..... *millicea* Hendel
- 10 (9). Peristomalium not barbate, or with very few short hairs at border; pterostigma with only two hyaline spots as a rule; third antennal segment parallel-sided, with or without a point at upper apex; a yellow hypopleural spot present.

- 11 (12). Face without black central stripe; peristomalia unspotted; no postverticals evident; third antennal segment with upper apex pointed; ovipositor with sparse fine hairs ..... *strumosa*, n. sp.
- 12 (11). Face with a black central stripe; peristomalia with dark spot; postverticals well developed; ovipositor with dense spinose hairs.
- 13 (14). Third antennal segment with a prominent point at apex above; second wing vein with a stump; ocellars distinct; black costal spots rather distinct ....  
..... *maculipennis*, n. sp.
- 14 (13). Third antennal segment less pointed; no stump on second wing vein; ocellars not distinct; black costal spots less distinct ..... *minor*, n. sp.

EPICERELLA PLAGIATA, n. SP.

Very like *Toxura angustifrons* Hendel, which species may possibly belong to this genus, although the chaetotaxy is described as 'wie bei den anderen Arten', but very readily distinguished by the broader frons.

Type male, in the Health Dept. collection, from Sydney, N.S.W., November 12, 1923.

Male.—Length of body and wing 9 mm. Occiput reddish-brown above, blackened near the vertex and the upper border of the eyes, whitish on the lower swellings, with a few scattered dark hairs. Frons parallel-sided, as broad as one eye, about twice as long as broad, the median stripe reddish-brown, the sides whitish and rather broad, both clothed with short dark hairs, those of the anterior part longer; ocellar spot black, with three approximated ocelli, but without ocellar bristles; an elongated blackish spot at insertion of superior orbital; in profile the frons is produced forward about one-third of the length of the eye, the latter rather small, twice as high as long, with small facets and with the lower margin much above mouth level. Antennae short, entirely reddish, second segment considerably shorter than the third, with a few black hairs, third segment parallel-sided, with the upper terminal angle distinctly produced but not acute; arista bare, twice as long as antenna, inserted basally. Face as broad as one eye, parallel-sided, antennal grooves extending to the lower level of eyes, almost coalescent, the central keel very slight; parafacials a little narrower than third antennal segment; supraoral plate darkened, blackish on sides and at base of central keel. Peristomalia opaque yellowish, unspotted, one-third as broad as the vertical diameter of head, bare, with only a few dark hairs at border; palpi small, not dilated, yellowish, with black bristly hairs; proboscis thick, dirty reddish; cephalic bristles black, two pairs of verticals, the inner pair very long, postverticals very small; only one superior orbital, strong but short, and directed outwardly. Thorax yellowish, slightly shining, dorsum with four broad reddish-brown vittae, the laterals interrupted at the suture and divided posteriorly, the vittae on hind portion thus being six in number; pleura blackish-brown, except a broad pale patch on upper part; pubescence short, blackish, very sparse on pleura; scutellum dark reddish-brown, pale yellowish on sides and below; mesophragma reddish, with a whitish hypopleural spot; bristles black, long and strong, propleural series well developed, one humeral, two notopleurals, one presutural, one anterior supra-alar, two posterior supra-alars, two dorsocentrals, one prescutellar, two mesopleurals, one pteropleural, one sternopleural, and four scutellars, the scutellum without additional hairs. Halteres whitish. Abdomen reddish, yellowish on sides and hind margins of median segments; basal segment constricted at base, and there with a black central vitta, as long as the two following segments combined; fourth segment a little shorter than basal one; pubescence and bristles black. Legs yellowish, with the fore femora blackened outwardly, and the four posterior femora almost entirely

black; pubescence and bristles black, but the latter not strongly developed, forming series only on the posterodorsal surface of fore femora; coxae simple; tarsi short. Wings with the veins as in *Toxura variegata* Hendel, and the pattern very similar, with the black stigma, which is pale yellowish at base; the first dark fascia is broader than in *variegata*, beginning before the stigma, and having in the middle a hyaline streak in the base of the submarginal cell as in *angustifrons* Hendel; the apical fascia has a rounded hyaline spot at apex of the submarginal cell, and two or three similar spots in the first posterior cell; in addition, the second and third posterior cells and the apex of the discoidal cell have 12-14 rounded hyaline spots, which are quite faint; there is also a hyaline spot in the middle of the axillary lobe.

- EPICERELLA SETOSA, n. sp.

Very similar to the preceding species, but distinguished by the stronger bristles, and the less well marked wing pattern.

Type female, in the Health Dept. collection; locality, Milson Is., October 31, 1914.

Female.—Length of body and wing 10 mm. Head, its pubescence, and bristles as described for the preceding species; but the frons is distinctly shorter, projecting only as far as width of third antennal segment; the antennae are distinctly longer, with the third segment more rounded at apex; there are two superior orbitals and a pair of short ocellars. Thorax as in preceding species, with the dorsal hairs longer; four dorsocentrals; mesopleura more hairy above. Abdomen opaque reddish, with narrow yellowish hind border to the tergites, and with long black bristles on sides; basal segment as long as the next three combined; ovipositor shining reddish-brown, blackened on sides, broadly conical, clothed with numerous thick black bristles and hairs which are longer ventrally. Legs reddish, the four posterior femora very little darkened; fore pair with a long rigid bristle at base ventrally. Wings as in the preceding species, but with the dark pattern more reduced; the anterior fascia is composed only of the stigma and a spot in the submarginal cell, the inner cross-vein is distinctly clouded, the apical fascia is not extended beyond the third vein; the first posterior cell has four hyaline spots at apex; the remainder is spotted as in the preceding species, but the infuscation is very faint.

N.B.—Curiously enough the wing pattern of the present species is like that of *Toxura discoidalis*, caught at the same time and in the same locality; but the latter has no trace of hyaline spots on the posterior half of the wing; and in addition it has the two characteristic notopleural bristles of *Toxura*, and has the first abdominal segment short.

EPICERELLA PUNCTULATA Hendel.

*Archiv. f. Naturgesch.*, 1914, p. 114, fig. 14.

Very distinct from all the other known species on account of its larger size and of the numerous bristles on hind margin of the scutellum.

Described from the female. Locality, W. Australia. Type in British Museum. Not seen.

EPICERELLA GUTTIPENNIS Macquart.

*Mem. Soc. Sci. Lille*, 1851, p. 267, pl. 27, fig. 9 (p. 294 of the reprint).

Apparently distinct in having but one hyaline spot in the pterostigma.

Described from Tasmania. Type in Paris Museum. Not seen.

## EPICERELLA MILIACEA Hendel.

*Archiv. f. Naturgesch.*, 1914, p. 112, fig. 13.

Distinguished by the peculiar wing pattern, with three hyaline spots in the pterostigma, and the barbate peristomalia.

Described in both sexes from Burpengary and Townsville, Queensland. Types in British Museum. I have seen one male from Mt. Kosciusko, December 7, 1922 (Goldfinch), and one female from Dorrigo, February, 1920 (Wright).

The peristomalia bears along the anterior border a row of long numerous dark hairs, very characteristic of the species, but not recorded in the original description. The third antennal segment is attenuated at apex, but has no prominent upper apical angle. The three hyaline spots in the stigma are typically present, but they may occasionally be absent in one or both wings.

## EPICERELLA STRUMOSA, n. sp.

This and the following two species belong to a group of allied species distinguished by their smaller size, the yellow hypopleural spot, and their variegated wings. The present species is distinguished from the other two by the gibbous ovipositor, which is clothed with sparse thin hairs instead of the bristly thick hairs of the other two.

Type female, a poorly preserved specimen in the collection of the Health Dept. Locality, Mosman, Sydney, N.S.W.

Female.—Length of body and wing 7.5 mm. Occiput opaque yellowish, darkened above, and clothed with dark pubescence, lower swellings broad, but not very prominent. Frons parallel-sided, a little narrower than one eye, about twice as long as broad, and not very prominent, in profile projecting about as far as width of third antennal segment, opaque reddish on central stripe, greyish on sides, with a black ocellar spot, on which are three approximated ocelli, the dark hairs are sparse, the central stripe being almost bare; parafacial narrow, linear below, greyish; face short, pale yellowish, with almost coalescent grooves, the median keel being faintly developed above; eye oval, bare, with small facets, twice as high as long, the lower margin almost level with mouth border, supraoral plate very long, narrow, entirely opaque yellowish; peristomalia comparatively narrow, as broad as one-fourth the vertical diameter of eye, unspotted, with short hairs along anterior margin. Antennae short, extending very little below middle of eyes, the basal segments yellowish, second with very sparse and short hairs, third segment reddish, infuscated, about as long as second, with rather prominent upper apical angle; arista a little longer than the antenna, yellowish, bare, thickened basally; palpi and proboscis yellowish, the former with a few black bristly hairs. All cephalic hairs and bristles black, two verticals, the inner much longer than the outer, ocellars and postverticals very short, orbitals apparently rubbed off. Thorax opaque reddish, a little grey dusted on the dorsum, and there with rather indistinct darker vittae; pleura yellowish below the notopleural line, with blackish spots in middle, the hairs very sparse and short even on the pleura, chaetotaxy complete, one humeral, two notopleurals, one presutural, one anterior supra-alar, two posterior supra-alars, two or three dorsocentrals close together, one prescutellar, one mesopleural, one pteropleural, and one sternopleural, all the bristles black; propleural series well developed; scutellum yellowish, with two dark dorsal stripes, almost bare, with four bristles. Mesophragma reddish-brown, slightly shining, on each side with a striking pale yellowish hypopleural spot. Halteres pale yellowish. Abdomen opaque reddish, unspotted, with black pubes-

cence and bristles; first segment longer than all the others combined; ovipositor a little longer than the whole abdomen and broader than it, swollen, gibbous beyond middle, constricted posteriorly, shining reddish, with sparse fine dark hairs above and below. Legs entirely opaque reddish, unspotted, comparatively slender, almost bare, without series of bristles; fore femora below with one rigid bristle near the base; tibiae slender and straight; tarsi long. Wings normal, second vein straight, without stump, third vein bare at base, straight, apical section of fourth vein complete, and curved downward apically; inner cross-vein at middle of discal cell; outer cross-vein straight, long, perpendicular, shorter than its distance from inner; anal cell broad at apex, with the lower apical angle acute, but not much produced. The pattern of wing is less pronounced than and similar to that of *miliacea*; no distinct black patches on costal margin; stigma with a basal hyaline spot and another rounded median spot, a third spot being present only on one wing; the remainder of the wing is slightly infuscated, with large rounded, indistinct hyaline spots disposed in two series in the submarginal and first posterior cell and in three irregular series in the second and third posterior cells, and also in the distal half of discal cell. Inner cross-vein broadly margined with fuscous, but the darkest part of wing is the stigma.

EPICERELLA MACULIPENNIS, n. sp.

Characterized by the black facial stripe and by the wings having distinct black patches along the costal margin.

Type female, in the Health Dept. collection, from Gisborne, Victoria, December 18, 1921 (G. Lyell). Two specimens taken *in copula*, Lakes Entrance, Victoria, October, 1919 (F. E. Wilson, sent by H. G. Hill).

Female.—Length of body and wing, 7.5-8 mm. Head and its appendages as described for the preceding species; frontal stripe narrower and clothed with longer and more numerous hairs, principally on anterior part, even the short orbital plates are black like the ocellar spot; third antennal segment with a well developed upper apical point, face with a black stripe along the central keel and the supraoral plate in part black; peristomalia with a blackish elongate mark below eyes; postverticals rather long and diverging, two orbitals, the upper one shorter, ocellars small but distinct, genal bristles strong. Mesonotum with a distinct pattern, consisting of four blackish vittae, the outer pair broadest and beyond the suture an additional supra-alar vitta; humeri and notopleural region pale yellowish; pleura with large black spots; scutellum, mesophragma, and the hypopleural spots as in preceding species; chaetotaxy similar, but the dorsocentrals extending to the suture; three strong mesopleurals. Halteres whitish. Abdomen subopaque reddish, with black pubescence and bristles; in the male the first segment is as long as the two succeeding segments combined, the fourth is as long as the third; in the female the first segment is as long as the four following segments combined, the ovipositor is longer than the abdomen and broader than it, shining reddish, clothed above with rather numerous short and thick bristly black hairs which are longer below, gently convex above, and blunt at apex. Legs as in preceding species, the femora sometimes slightly infuscated, and more bristly, the fore pair being provided below with a series of short bristles besides the long rigid basal bristle. Wing venation as in preceding species, but a stump present on second vein; the stigma has also a basal and a middle hyaline spot, and sometimes a small round dot is present at apex. Characteristic of the species are the black patches on costal margin forming almost bands, one before stigma and origin of

second vein, one on the inner cross-vein, one over the outer part of all but end of marginal cell, continued below in apex of submarginal and first posterior cell. The hyaline spots are uneven and well defined, but those in middle of submarginal cell and base of first posterior cell are confluent. The darker apices of submarginal and first posterior cells have two series of irregular hyaline spots, in the second posterior, third posterior, and terminal half of discoidal cells, the rows are three but always irregular.

EPICERELLA MINOR, n. sp.

Differs from the preceding species in being smaller, and in the different antennae and wing markings.

Type male, a specimen from Mt. Kosciusko, December 7, 1922 (Goldfinch) in the Health Dept. collection. A poorly preserved female specimen from South Australia is placed doubtfully here.

Male.—Body and wing 6 mm. Head as in the preceding species and with the same chaetotaxy, but the ocellars are not distinct and there is but one orbital. The frontal stripe is narrower, being only a little wider than one parafrontal. Third antennal segment reddish, rounded at apex, with a prominent, more acute, upper apical angle. Black facial stripe and dark peristomial spots as in preceding species. Thorax as in that species, the three dorsocentrals extending to suture. Abdomen similar, with shining blackish stripes on sides of third and fourth segments; the ovipositor of the supposed female is very like that of the preceding species both in form and vestiture. Legs as in that species, extremities of femora and tibiae of hind pair infuscated. Wings with same venation and very similar pattern, no stump on second vein, the hyaline spots are less numerous but disposed in the same way, the blackish spots along the costa are not distinct, being limited to the second vein and not extending below, thus there is no distinct spotting of the costa.

4. ACROPYRGOTA Hendel.

This peculiar Australian genus was compared with *Toxura* by Hendel, but I think it is more closely related to *Adapsilia*. The basal abdominal segment is longer than in *Toxura*, though not so long as in the other genera, but the absence of ocelli and the presence of but two notopleurals (1:1) distinguish it from *Toxura*. From *Adapsilia* and all other genera it is distinguished by the pointed third antennal segment. The second wing-vein never has a stump of a vein as in *Adapsilia*, and the fourth vein is curved down before inner cross-vein.

The species may be distinguished as follows:

- 1 (2). Head distinctly swollen; abdomen reddish; wings hyaline . . . . *flavescens* Hendel  
 2 (1). Head not swollen; abdomen black; wings infuscated, with numerous hyaline dots  
 . . . . . *cribripennis*, n. sp.

ACROPYRGOTA FLAVESCENS Hendel.

*Arch. f. Naturgesch.*, 1913 (1922 in Bezzi's ms.), p. 112, fig. 12.

Described from a female, without locality, but listed by Hendel as from Australia. Type in British Museum. Not seen.

ACROPYRGOTA CRIBRIPENNIS, n. sp.

A robust fly, distinguished by its pointed third antennal segment, and its wings very like those of *Epicerella miliacea* Hendel, from which it is distinguished by the black abdomen, different antennae, and lack of ocelli.

Type male, Bright, Victoria (H. V. Davey); allotype, Singleton, December 30, 1923 (Nicholson).

Male and female.—Length of body and wings 11-13 mm. Occiput opaque reddish, pale yellowish on the lower swelling, and with four black stripes radiating from the neck to the eyes; the scattered hairs are black. Frons about as wide as one eye, or a little narrower; no vertical keel, but the ocellar triangle is prominent, bearing however no distinct ocelli, the central stripe is opaque reddish and bare, the parafrontals are whitish, with sparse black hairs, and a short black stripe at insertion of orbital bristle; ocellar spot whitish; in profile the frons is projected about as far as width of antenna. Eyes oval; parafacials whitish, as broad as antenna, with some white hairs; cheek about one-third as high as vertical diameter of eye; facial grooves about half as long as face, separated by a narrow yellowish keel; antennae short, dusky yellowish at bases, blackish at apices, second segment as broad as, and a little longer than, third, with short pale hairs, third segment triangular, very sharp at apex; arista short, yellowish at base, bare, a little longer than antenna, thickened at base, slender apically. Bristles black; two verticals, postverticals long and diverging, two orbitals, but the basal (*sic*) one often indistinct. Mesonotum reddish, a little shining, with faint greyish dust, and with four blackish vittae; pleura shining reddish, with blackish or brownish shading; humeral one, notopleurals two (1:1), dorsocentrals one pair; sternopleural one, scutellum blackish-brown, yellowish on sides, and with 6-8 marginal bristles. Halteres pale yellowish. Abdomen entirely black even on venter, shining above, in the male the first segment is as long as fourth and the second and third are of equal length, the female has the first segment as long as second and third combined, the following very narrow; hairs and bristles black. Legs usually reddish, the femora sometimes infuscated; hairs and bristles black; claws very large. Wings with the usual venation, about as in Hendel's figure of the wing of *miliacea*, with stump on second vein; the fourth vein is curved downward into discal cell before inner cross-vein, the cell being narrowed at base. In my specimen of *miliacea* the fourth vein is straight, while Hendel's figure shows the vein a little curved. Wings infuscated and with hyaline spots, differently marked in the two sexes. In the male the spots are very uneven and small, well separated, three rows in the first posterior cell, 4-5 irregular rows in the second and third posterior cells, and three rows in the apical portion of discal cell. In the female the spots are much less numerous, browner, and confluent, only two or three rows in the cells.

##### 5. ADAPSILIA Waga.

This genus is recorded here for the first time from Australia, and is one of the few genera not peculiar to the continent. The species here described is of ordinary form and is a typical member of the genus, showing a great resemblance to *flavopilosa* Hendel described from Japan, from which it is distinguished by the entirely hyaline wings.

##### ADAPSILIA ILLINGWORTHIANA, n. sp.

A reddish fly of large size, with entirely yellowish hairs and bristles and immaculate wings.

Type, a single male specimen from Cairns, N. Queensland, collected at light by Dr. J. F. Illingworth and named in his honour.

Male.—Length of body and wing 12 mm. Occiput opaque reddish, without black markings, and with reddish pubescence, lower swelling much developed,



darker than the surrounding parts; vertical keel high, the ocellar region dark behind, and pale before keel. Frons short, twice as wide as one eye, opaque reddish, with a dark spot at base of each orbital bristle; it is flat above, and in profile projects as far as horizontal diameter of the very narrow eyes, the latter have their hind corner at level of ends of grooves; the very broad parafrontals are glistening, with sparse scattered yellowish hairs above, the hairs on anterior part of frontal stripe longer. Antennae proportionately long, entirely reddish, second segment rather slender, twice as long as first, with short reddish hairs, third segment distinctly longer than second, not much attenuated on its apical half, truncate at tip; arista basal, longer than whole antenna, thickened basally. Antennal grooves shining reddish, elongate, with a sharp keel between them, terminal plates below the grooves opaque yellowish, darkened above, a little prominent in profile; cheeks broad, two-fifths of antennal length, shining on upper half, opaque on lower half, with a blackish elongate spot below lower corner of eye, bare at border. Palpi yellowish, with yellowish bristles; proboscis thick and short, with pale hairs. Bristles reddish, usually only one pair of postverticals and one pair of orbitals, and a smaller outer pair present. Mesonotum entirely reddish, slightly shining, with short reddish pubescence, humeri paler than surrounding parts; pleura and mesophragma reddish-yellow, shining, without paler or darker parts; one humeral, three notopleurals, one pair of dorsocentrals, one sternopleural, and 1-2 mesopleurals. Scutellum coloured as mesonotum, with four yellowish bristles. Halteres pale yellowish. Abdomen entirely reddish, slightly shining, immaculate, with reddish hairs and bristles; first segment constricted on basal half, scarcely as long as rest of abdomen. Legs entirely reddish, with reddish bristles and hairs, last segment of all tarsi dilated. Wings greyish hyaline, unspotted, veins entirely reddish, normal; stump of second vein strong, but not long; inner cross-vein at one-third from apex of discal cell; outer cross-vein at about its own length from inner one; lower angle of anal cell rather long and acute; fourth vein straight before inner cross-vein; third vein bare at base.

#### 6. *CAMPYLOCERA* Macquart.

This genus is well represented in the Ethiopian region. The species of the Oriental region are not entirely typical, having the fourth vein distinct to apex, but the costal vein is prolonged only a little beyond the apex of third vein. There is no stump of a vein on second vein.

The single species recorded from the Australian region is from New Guinea, and has the apex of fourth vein rather evident. There is a second species occurring in this region, the two being distinguished as below.

- 1 (2). Outer cross-vein of wing straight; apices of veins 2 and 3 infuscated; peristomalium broad, one-third as high as vertical diameter of eye . . . . . *brevicornis* Hendel  
 2 (1). Outer cross-vein of wing curved on its lower part; apices of veins not infuscated; peristomalium much narrower . . . . . *curvinervis*, n. sp.

#### *CAMPYLOCERA BREVICORNIS* Hendel.

*Wien. Ent. Zeit.*, 1908, p. 132.

A yellowish fly, with blackish abdomen and tibiae, and with the wings marked as stated above. New Guinea.

#### *CAMPYLOCERA CURVINERVIS*, n. sp.

Closely allied to the preceding species, but easily distinguished by the characters cited in the key above. Distinguished from *fuscipes* van der Wulp by the yellow femora and unspotted wings.

Numerous specimens of both sexes in Health Dept. collection from Manly, 10-15 November, 1922, and Sydney, N.S.W., December 3, 1922.

Male and female.—Length of body 7-9 mm., of wing 6-8 mm. Occiput entirely opaque reddish, unspotted, clothed with rather long and dense black hairs. Frons parallel-sided, narrower than one eye (in male as broad as), 1.5 times longer than wide, opaque reddish, clothed with black hairs, and with a dark ocellar spot; parafrenal very narrow, shining yellowish, not prominent in profile. Face very narrow in female, the parafacial being linear, broader in male, equal to eye; facial grooves long, shining reddish, extending about to mouth border, divided by a sharp central vertical keel. Eyes oval, vertical diameter twice that of longitudinal, anterior central facets much enlarged, notably in the female. Peristomalium and grooves reddish, in male equal to width of third antennal segment, in female much narrower, in both with blackish subocular spot. Antennae entirely reddish, long and porrect, second segment attenuated at base and little shorter than third, with black hairs, the third segment oval, little attenuated apically; arista a little longer than antenna, yellowish; palpi yellowish, with short black bristly hairs; proboscis dusky yellowish. Head bristles black, two verticals, one postvertical, one orbital, and four or five short ocellars, the anterior pair longest. Mesonotum shining reddish-yellow, with distinct dusting and dense black pubescence, pleura paler than mesonotum, with longer rigid hairs; humeri pale; scutellum convex, paler than mesonotum, with black hairs and four marginal bristles; mesophragma shining reddish-yellow; all thoracic bristles black; one humeral, two notopleurals, one or two dorsocentrals, one or two mesopleurals, and one sternopleural, all parts with some rigid black hairs. Halteres pale yellowish. Abdomen black above and below, shining above, the first segment is, however, almost entirely reddish-yellow; hairs and bristles black; first segment in female longer than rest of abdomen, about as long as it is in male, in which the apical segment is longer than the preceding segments, about as long as second and third segments combined; genitalia of male reddish; ovipositor of female shining reddish, longer than the entire abdomen, with dense and long, but not strong, black hairs; it is conical, swollen on basal half, suddenly attenuated on terminal half. Legs rather short and stout, with thickened femora, coxae and femora entirely reddish, only the four posterior femora sometimes darkened at apices, hairs and bristles black, all tibiae shining black, with more or less broad reddish bases, all tarsi entirely pale yellowish, or even whitish, all short. Wings broad, greyish hyaline, yellowish at bases and along costa, with no trace of fuscous markings, the veins all yellowish, second vein perfectly straight, without a stump, third bare at base, almost straight, ending at wing tip, the costa produced only a little beyond it, fourth curved downward before inner cross-vein, its apical section complete to tip, or only extreme apex evanescent, rather straight, directed backward, the first posterior cell being thus gradually widened outwardly; inner cross-vein oblique, beyond middle of discal cell, about at apical third; outer cross-vein straight on upper half, strongly bent inward on lower half, the discal cell extending at lower apex almost to margin of wing, the second posterior cell being almost triangular in shape; lower apical angle of apical cell narrow and acute, much produced, sixth vein complete, distinct only at base.

#### 7. *PRODALMANNIA*, n. gen.

This genus contains a very striking, rather small species, which, on a superficial examination, might be mistaken for an anthomyiid. It has a great resemb-

lance to some Conopidae, and has a slightly elongated and geniculated proboscis, a character unique in this family; the narrow frons is also an aberrant character.

The generic name alludes to the resemblance to the conopid genus *Dalmannia*, which has a short anal cell, a similar strong ovipositor, and a spirally curved penis in the male. In the genus *Stylogaster* the face is carinate, without grooves, the ovipositor is long, but weak and retractile, etc. In the Myopinae the anal cell is elongate, the penis is not spiral, etc. All these genera have ocelli, and all have the first posterior cell of wing narrowed apically, and even closed.

A rather small species, resembling some species of Anthomyiidae, but with head like that of Myopinae, and strong ovipositor as in Pyrgotidae.

Occiput flat, with slightly developed lower swellings. Frons elongate, flat, between the eyes it is much narrower in the male than in the female, while the anterior half is similarly shaped in both sexes; no vertical transverse keel and no ocelli present; in profile the frons is inclined forward and projects about as far as horizontal diameter of eye. Eyes bare, with small facets, oval in shape, quite small, being about equal in height to that of cheeks. Antennae very small and short, exerted, third segment shorter than second, rounded; arista basal, short, bare; parafacial broad and short; cheek very broad, subquadrate, bare; face short, with the grooves very short, rounded, and coalescent. Lower plate longer than face, flat, not prominent in profile. Mouth opening broad and short; palpi short and cylindrical; proboscis elongate, a little longer than head, with recurved terminal portion, this apparently geniculated, but shorter than the basal one. Cephalic bristles long and slender, two verticals, the inner decussate, one pair of divergent postverticals, and a pair of long reclinate orbitals. Thorax robust, subcylindrical, convex above, with the suture interrupted in middle, propleural tuft developed, one humeral, two notopleurals, and one pair of dorsocentrals; scutellum with three pairs of bristles, the apical ones decussate. Squamae rudimentary. Abdomen parallel-sided, rather flat, basal segment about equally long in both sexes, not constricted at base, male genitalia not visible from above, with spiral penis, female ovipositor strong, only a little shorter than abdomen, and broader than it, with some strong apical spines. Legs rather short and stout, with long hairs and bristles. Wings proportionately narrow, costa extending to apex of fourth vein, auxiliary vein thin, rather close to first vein, complete to apex, joining costa at an acute angle. First vein dilated, ending beyond middle of wing and a little beyond inner cross-vein, approaching gradually to costa, the enclosed cell at apex very narrow, second vein straight, a little backwardly curved on apical part, ending at tip of wing, and ciliated to the inner cross-vein. Fourth vein perfectly straight on all its length before inner cross-vein and on apical section, complete to apex, parallel with third, the first posterior cell not widened at apex; inner cross-vein beyond middle of discal cell, outer one straight, near hind margin; discal cell of normal shape; anal cell long, not much produced apically, its lower angle acute and prolonged; sixth vein extending to margin of wings, alulae large.

Type, the following species.

*PRODALMANNIA VARIABILIS*, n. sp.

A testaceous, black-spotted species, not unlike some species of the genus *Pegomyia* Robineau-Desvoidy.

Type, Health Dept., numerous specimens of both sexes from Manly, Sydney, N.S.W., November and December, 1923.

Occiput entirely black, a little shining, and dark grey dusted in male, in female the lower swollen parts and the vertical region are reddish; hairs black. Frons opaque reddish, with a broad black band beyond middle, the narrowest part in male is about one-fifth, in female about one-half as wide as one eye, it is without a vertical crest, the hairs and bristles are black, and the orbital pair is rather far from vertex. Antennae entirely deep black, even the arista, which is thickened basally, is so coloured, second antennal segment a little grey dusted, with some black hairs. Parafacials reddish, a little shining; cheek opaque reddish, without a dark mark, with some sericeous reflections, and wider than vertical diameter of eye. Face entirely reddish, central plate below grooves black above, and a black line on each side which extends along lower margins of cheeks. Palpi black, with black hairs; proboscis blackish, with black hairs. Thorax testaceous, shining, with paler coloured humeri and pleura, a black central vitta ending beyond suture, and one on each side of it which is somewhat shorter, usually coalescent; in the female these markings are sometimes much paler, even lacking; pleura with two black marks, one on the sternopleura and the other just above hind coxa; metanotum shining black. In the female there is a narrow black stripe at the base of the halteres. Scutellum testaceous, unspotted. Hairs and bristles all black, unusually long. Halteres pale yellowish. Abdomen shining testaceous, unspotted; in the darker specimens it is sometimes dark brown or blackened on parts. Male genitalia shining black, penis yellow; ovipositor of female shining black, with long sparse fine black hairs, basal spine black, terminal spines reddish. Legs variable in colour, all coxae reddish, femora reddish, more or less blackened apically, or even black with only the bases reddish, tibiae black, more or less reddish at bases, all tarsi deep black, short and thick, claws long, black; pulvilli whitish. Wings greyish hyaline, quite evenly yellowish at bases and on costa, veins yellowish, darkened on distal half of wing.

#### APPENDIX.

By J. R. MALLOCH.

(Text-figs. 1-14.)

About three years ago I was informed by the late Dr. M. Bezzi that he had in preparation a revision of the Australian Pyrgotidae, and some months before his death he assured me that the manuscript was practically complete. Subsequently the late Dr. E. W. Ferguson informed me that he had been unable to obtain any information from Dr. Bezzi as to when the manuscript would be submitted for publication, and on the death of Dr. Ferguson I undertook to obtain it if that were possible. Accordingly I wrote to Madame Bezzi regarding the manuscript and also the material upon which it was based and in due course received the former, but failed to get the specimens. I have just recently obtained the latter from Prof. B. Parisi of the Natural History Museum of Milan, where the Bezzi collection is now deposited, and am able to make a few figures and additions to the text which will better enable students to identify the species involved. My best thanks are due to Prof. Parisi for his assistance in this matter.

The manuscript was in part in the form usually submitted by Dr. Bezzi for printing, but much of it was in first draft form. By dint of careful work I have compiled a typewritten copy and am confident that with the exception of a few minor grammatical changes I have succeeded in accurately transcribing the text of the paper. Without figures it would be difficult for the tyro in this

family to make use of the paper with a great degree of success so I have furnished a number showing details of the species involved. The family is a very difficult one to work with and the discovery of more species will entail comparison with types to distinguish them satisfactorily from the species included in the present paper.

The genus *Pyrgota* in North America possesses two characters, the discovery of which caused me some years ago to publish the opinion that the genus is closely related to Conopidae, and not closely related to Ortalidae in which latter family it has generally been placed. These two outstanding characters are the absence of ocelli and of the prong-like process on outer side of mid coxa which is so conspicuous in most cyclorrhaphous Diptera, but the prong or both prong and ocelli are absent in Conopidae. These two characters hold good for all the species of Pyrgotidae occurring in the Nearctic region, and for the greater part for those genera in Central and South America which have been placed in the family by other authors.

In Australia, however, we find that if all the species placed in the family belong therein either or both of the characters fail, a number of the genera possessing both ocelli and mid coxal prong. In fact some of the genera in the foregoing paper are more evidently related to Ortalidae than they are to Conopidae, and the isolation of the family on structural grounds becomes difficult indeed, almost the only means of separation then consisting of the peculiar cylindrical or subcylindrical, and more or less conical, sheath of the female ovipositor. This portion of the abdomen is not the true ovipositor as one would infer from descriptions that have appeared, but is a horny container for the true ovipositor, which is lance-like and not very different from that of many Ortalidae and Lonchaeidae.

In his introductory remarks in this paper Dr. Bezzi enumerates the principal characters of the family. Taking these characters in order, and using as a basis the species of the two hemispheres, we find that the ocelli are invariably lacking in those species which have no mid coxal prong, though some species which have a rudimentary prong lack the ocelli also, and rarely there are only two rudimentary ocelli present; the lunule is not always concealed; the prelabrum is variable in size; there is never a well developed propleural bristle present, but this is frequently lacking in Ortalidae; the tibiae have sometimes a weak dorsal bristle close to apex; the first vein is invariably setulose above, but it is so also in many Ortalidae, etc., and the third vein is frequently setulose at base above; lower apical angle of anal cell with or without an acute production; penis spiral, but frequently so in Ortalidae and some other families.

It must be apparent from a perusal of the foregoing list of characters that the segregation of genera into families is attended with considerable uncertainty if those are the only characters available. But if one takes the two characters which are invariably indices to the Pyrgotidae of the New World, and in addition to these the lack of any longitudinal dorsal cleft in the second antennal segment, I believe the problem will be solved for the Australian region.

We will then have in Pyrgotidae only species which have the second antennal segment entire (Text-fig. 1), the ocelli lacking or rudimentary, and the mid coxae without a well developed prong. In addition the empodium is without a fringe of fine hairs. The species resembling Pyrgotidae most closely belong either to Platystomidae or Ortalidae. The former is generally considered a subfamily of Ortalidae, and contains a few genera that may be confused with Pyrgotidae,

but they have the second antennal segment deeply cleft above, and the lower calypter very large, in fact as large as in many Tachinidae, besides possessing a distinct mid coxal prong. The lower calypter is shorter than upper in Pyrgotidae, usually very rudimentary. The other genera, including *Toxura* Macquart, I would assign to the Ortalidae on account of the presence of ocelli, a well developed mid coxal prong, or a cleft second antennal segment. In most Ortalidae and related families likely to be confused with Pyrgotidae the empodium is fringed to, or almost to, apex.

I hope shortly to be able to publish a paper on the Pyrgotidae of the New World in which the status of the family will be more thoroughly discussed, but in the meantime present the data given above that they may be available to Australian students.

It is not proper that I should alter the main part of this paper in any manner, but below I present a key to the genera available to me, using for their separation a different set of characters from those used by Dr. Bezzi, and dividing his concept of *Toxura* into two segregates. This is done at the present time so that the matter will the more readily be available to students than if I embodied my system in a separate contribution. Generic concepts are variable with authors and it is very probable that in one or two cases the Australian genera as now accepted will be further divided, and particularly is this likely with *Epicerella* Macquart which appears to me to be composite, as herein included. However, the matter is one for future consideration by some worker to whom more material is available.

*Key to the Genera.*

1. Subcostal vein rectangularly bent forward at apex which is well removed from apex of first vein, the latter not swollen at apex, and distinct to tip (Text-fig. 2); ocelli normally evident; second antennal segment almost invariably distinctly cleft above at apex; mid coxal prong well developed (*Toxurini*) ..... 2
- Subcostal vein not rectangularly bent forward at apex; if the extreme apex is poorly developed, it lies close to apex of first vein and the latter is almost invariably swollen apically and more or less fused with costal vein (Text-fig. 13); if the first vein is distinct to apex, the second antennal segment is cleft and the mid coxal prong is present ..... 6
2. Notopleural bristles 1 + 2 or 3; base of third wing vein setulose above; first vein bent forward at extreme apex; each frontal orbit with two bristles above; scutellum haired on disc ..... *Neotoxura*, n. gen.
- Notopleural bristles 1 + 1; base of third wing vein usually bare above ..... 3
3. Scutellum haired on disc; cheek about two-thirds as high as eye ..... *Acropyrgota* Hendel\*
- Scutellum bare on disc, with only marginal bristles ..... 4
4. First wing vein ending at or before level of inner cross-vein; cheek almost as high as eye; presutural bristle absent ..... *Toxura* Macquart
- First wing vein almost invariably ending distinctly beyond level of inner cross-vein; cheek rarely more than one-half as high as eye; presutural bristle present .. 5
5. Fourth wing vein with a pronounced curve into discal cell in front of inner cross-vein, the discal cell very much narrower proximad of inner cross-vein than beyond it ..... *Epicerella* Macquart, part
- Fourth wing vein not noticeably curved into discal cell proximad of inner cross-vein, that cell gradually and rather regularly widened from base to apex ..... *Epicerella* Macquart, part
6. Second antennal segment with a distinct longitudinal cleft at apex on upper side .. 7
- Second antennal segment without a distinguishable longitudinal cleft at apex on upper side ..... 9

\* I have not seen the genotype of this and it may not belong to *Toxurini*.

7. Ocelli well developed; head in profile quadrate, frons in both sexes about half the head width, face with a flat central carina which is narrower above, becomes wider below, and has the lateral edges sharp, antennal grooves deep, centre of face projecting beyond antennae in profile (Text-fig. 8); third wing vein setulose at base above, venation as in Text-figure 9 ..... *Maenomenus* Bezzi  
Ocelli lacking; head higher than long; facial carina not as above, without sharp lateral edges, antennae quite evident in profile (Text-fig. 12) ..... 8
8. Frons of male at vertex about one-seventh of the head width, that of female not one-third of head width at same point; profile of head as in Text-figure 12; vein closing anal cell slightly biangulate ..... *Prodalmanzia* Bezzi  
Frons of male at vertex more than half of the head width; profile of head as in Text-figure 10; vein closing anal cell practically straight ..... *Frontalia*, n. gen.
9. Vertex distinctly elevated, almost carinate ..... *Adapsilia* Waga  
Vertex not at all elevated ..... 10
10. Fourth wing vein evanescent at apex, the costa discontinued a little beyond apex of third vein; prosternal plate elevated and haired on sides; third wing vein bare at base ..... *Campylocera* Macquart  
Fourth wing vein distinct to apex, the costal vein narrowed beyond apex of third vein but quite evident to apex of fourth; prosternal plate flat and bare; third wing vein setulose at base above ..... *Nicholsonia*, n. gen.

#### Tribe *Toxurini*.

I propose to include in this tribe the genera *Toxura* Macquart, *Epicerella* Macquart, and *Neotoxura* Malloch, with possibly also *Acropyrgota* Hendel, the last being unknown to me except from the description. The group does not, in my opinion, belong to the family Pyrgotidae, but to Ortalidae. I base my conclusion upon the fact that the species have the second antennal segment cleft, possess a mid coxal prong, and usually also more or less well developed ocelli. A striking character which distinguishes them from most Ortalidae is the subapical rectangular bend of the subcostal vein of the wing. In this character the species are very similar to typical Trypetidae, but all the members of the latter family have incurved bristles on the anterior half of each frontal orbit, which are never present in either Ortalidae or Pyrgotidae.

#### NEOTOXURA, n. gen.

This genus contains at least four of the species placed by Bezzi in *Toxura*. It differs from that genus in having the posterior notopleural bristle duplicated, the base of third wing vein setulose above, face almost vertical and without a pronounced central hump, the lower angles of facial ridges not noticeably closer than central portions and below lower margins of eyes, each orbit with two bristles on upper portion, and the scutellum haired on disc.

Bezzi did not have the genotype of *Toxura* in his material, hence his alignment of the species in the preceding paper.

Genotype, *Toxura discoidalis* Bezzi. (Text-fig. 2.)

The other three species which I place in this genus on the basis of material in hand are *Toxura robusta* Bezzi, *Toxura variegata* Hendel, and *Toxura longipalpis* Hendel. I doubt whether *Toxura microps* Hendel can be referred here, and am almost certain that *T. angustifrons* Hendel can not be.

The key given in the main part of this paper will suffice for the identification of the species of the genus now generically distinguished from *Toxura*.

#### NEOTOXURA LONGIPALPIS (Hendel).

Readily distinguished from its congeners by the deep black antennae and palpi.

Locality, Wahroonga, Sydney, N.S.W., 24.10.1926. Submitted by Dr. E. W. Ferguson, but the specimen bears no collector's name.

*Toxura* Macquart.

I have before me a specimen which I identify as *maculipennis* Macquart, the genotype, though the markings of the wings are larger than in Macquart's figure and there is a small hyaline spot in outer apical angle of the preapical mark not shown by him (Text-fig. 3).

The specimen differs from the species placed by me in the preceding genus in the following characters: Posterior notopleural bristle not duplicated, base of third wing vein bare above and below, face with a quite pronounced hump which is highest about middle of head in profile, the facial ridges convergent below, the angle situated at or above lower level of eyes, each orbit with one bristle above, postverticals lacking; first vein gradually approaching costa apically, its tip not beyond inner cross-vein; palpi strap-like; scutellum bare on disc.

*TOXURA MACULIPENNIS* Macquart.

This species would be difficult to identify by the use of the key given in the main part of this paper as the wings might as reasonably be considered banded as those of *variegata* and *robusta*, though the two prominent black marks on the costa do not pass much beyond the fourth vein on the field of the wing.

Locality, National Park, Sydney, N.S.W., 21.3.1925 (Health Dept.).

*Epicerella* Macquart.

This genus as accepted by Dr. Bezzi is more diversified than any other in the Australian fauna, and I am undecided upon the propriety of distinguishing the various segregates as genera or even subgenera.

Of the three previously described species only one is amongst the material now available, and that one is not the genotype. I have removed *Acropyrgota cribripennis* Bezzi to this genus as it agrees better with *Epicerella* than with *Acropyrgota*, though the genotype of the latter is also unavailable to me. The key presented in the main part of this paper will suffice for the separation of the species included therein, and below I present a supplementary key which includes only the species actually available for examination, two of which were not in Dr. Bezzi's material.

*Key to the Species.*

1. Mesonotum with at least two pairs of well developed postsutural dorsocentral bristles; second wing vein usually without an appendage ..... 2  
    Mesonotum with only one pair of well developed dorsocentral bristles; second wing vein always with an appendage on underside of apical section ..... 7
2. Lower calypter with some long hairs on margin which are mostly longer than calypter; pterostigma (i.e., section of cell between apices of auxiliary and first veins of wing) fuscous, slightly paler at base ..... 3  
    Lower calypter densely downy or pubescent on hind margin, without outstanding hairs; pterostigma fuscous, with a well defined hyaline spot at base and another at, or near, apex ..... 4
3. Each orbit with one bristle; wing markings more extensive and darker, the dark mark over inner cross-vein extending posteriorly to furcation of second and third veins ..... *plagiata* Bezzi  
    Each orbit with two bristles; wing markings less extensive and paler, the apical portion of first posterior cell with a dark mark at furcation of second and third veins and another over inner cross-vein ..... *setosa* Bezzi



4. No hyaline spots in the apical fuscous portion of wings between second vein and the costa, and only a hyaline streak in it on apical section of submarginal cell (Text-fig. 5); face entirely yellow; ocellar triangle deep black, shining, the ocelli entirely lacking in type (male) ..... *triangularis*, n. sp.  
 One or more hyaline spots in the dark apical portion of wing in the submarginal, and almost invariably also in the marginal cell (Text-fig. 7); face partly dark brown or black except in *strumosa*; ocelli always present, sometimes small ..... 5
5. Face without a dark stripe; sheath of ovipositor of female with fine short hairs on entire surface, a few longer and stronger hairs at apex below .. *strumosa* Bezzi  
 Face with a conspicuous black central stripe, very wide below; sheath of ovipositor of female with quite strong bristles on sides of dorsum and at least the apical half ..... 6
6. Fore femur of male with some well developed bristles on basal half of posterior, and apical half of posterodorsal, surface; second wing vein with an appendage ..... *maculipennis* Bezzi  
 Fore femur of male without distinguishable posterior or posteroventral bristles; second wing vein without an appendage ..... *minor* Bezzi
7. Third wing vein setulose at base above; hind coxae of male black haired below, the hairs very short in front, becoming denser and longer to posterior margin, the trochanters similarly but less densely haired, both coxae and trochanters in female with a ventral patch of dense black spinules ..... *miliacca* Hendel  
 Third wing vein bare at base above and below; hind coxae in neither sex densely haired below ..... 8
8. Large species, more than 10 mm. in length; scutellum with at least six marginal bristles; no outstanding bristles on hind femur of male, a few of moderate length on apical half of dorsal surface in female; ocelli present .... *cribripennis* Bezzi  
 Smaller species, about 7 mm. in length; scutellum with four marginal bristles; two or three outstanding bristles of about the same length as diameter of femur on apical half of anteroventral and dorsal surfaces of hind femur; ocelli lacking ..... *multipunctata*, n. sp.

#### EPICERELLA PLAGIATA Bezzi.

This species is very similar to *setosa* and the two may eventually be found to represent the sexes of one species. The character of the dorsocentral bristles cited by its describer in his key for separating it from *setosa* is not used by me because I think that the type specimen of the latter is abnormal in this respect, the series of bristles that is intact in the type suggesting this conclusion by their irregular arrangement. More material is essential to decide the question, but meanwhile the evidence would appear to justify them being considered as distinct. In both species there are a very few hairs on the mesosternum in front of the series of bristles on the hind margin, and this character distinguishes them from nearly all the others in the section of the key set apart by the characters cited in section 1 of caption 1 of the key presented above.

The fore femur of the type of *plagiata* has the basal ventral bristle much longer than does that of *setosa*, but this is the case in the sexes of *maculipennis* also.

#### EPICERELLA SETOSA Bezzi.

A noteworthy feature of the female type is the exceptionally strong bristling of the sheath of the ovipositor. The bristles on the sides are quite strong and slope upward, the central portion of dorsum on basal half is less strongly and densely bristled, and there is a bare median stripe on apical half of disc, the central portion of basal half of venter is furnished with rather closely placed strong sharp-pointed bristles, and laterad and apicad of these the surface has much sparser, finer, and longer, bristles. The basal ventral bristle on fore femur is one and a half times as long as diameter of femur.

I can trace no similarity between the wing markings of *Neotoxura discoidalis* and this species, contrary to the statement of the author of both. The sheath of the ovipositor and many other characters are radically different in the two species.

EPICERELLA MILIACEA Hendel.

I accept Bezzi's identification of this species, though the examples in the collection do not agree in all particulars with Hendel's description. It appears pertinent to state that the term "peristomalia barbata" may be misleading. There is a series of fine closely placed hairs along the margin of the cheek and extending upward to level of facial protuberance, but except for the fact that these hairs are longer than usual there is nothing noteworthy in their presence, as similar hairs are present in all the species of the genus. Also the pterostigma is not invariably tripunctate, the male in the collection having two spots on one wing and three on the other. In fact the variation in maculation in the species with multipunctate wings is so great that such markings can be used only in a general way for purposes of specific identification.

EPICERELLA STRUMOSA Bezzi.

The type specimen of this species appears to have been at one time in liquid and is slightly bleached so that the immaculate face may not be the normal condition.

EPICERELLA CRIBRIPENNIS Bezzi.

I have a male which appears to belong here, but a series is necessary to make clear the limits of variation in the species.

Locality, Townsville, Queensland, 26.11.1926, at light (F. H. Taylor).

EPICERELLA TRIANGULARIS, n. sp.

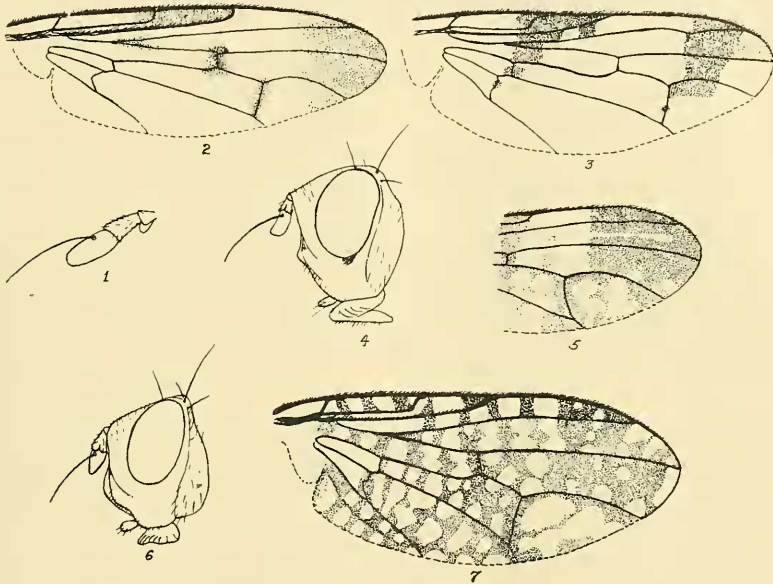
Male.—Testaceous yellow, slightly shining. Ocellar triangle shining black, quite conspicuous, anterior portion of frons orange, a dark mark below each eye on centre of cheek, face entirely pale; antennae and palpi yellow. Thorax with four brown dorsal vittae, the submedian pair abbreviated behind, the sub-lateral pair abbreviated in front, a brown supra-alar mark, a pale brown stripe on each side of disc of scutellum, and brown marks on anterior and lower margins of mesopleura, centre of pteropleura, the sternopleura above halteres, and on all of postnotum. Abdomen slightly tinged with brown on parts. Legs yellow. Wings marked with brown, most conspicuously so on costa from before apex of auxiliary to apex of first vein (the pterostigma with two pale spots), over both cross-veins, and on apical section (Text-fig. 5).

Head in profile as Text-fig. 4; frons parallel-sided, more than one and a half times as long as wide, outer vertical bristles about half as long as the inner pair and quite well developed, equal in length to the pair of orbitals, the latter with a very fine hair behind each, postverticals short and hair-like, ocellar triangle well defined, extending almost to level of the orbitals, no ocelli evident; third antennal segment angulate on upper extremity; palpi strap-like. Thorax with two pairs of strong postsutural dorsocentrals, the other bristles also well developed, scutellars four in number; propleura with a vertical series of three or four bristles and some fine short hairs centrally, and a few microscopic hairs on extreme lower margin. Abdominal tergites 2 and 4 subequal in length, the

lateral bristles not very long. Hind femur with one or two outstanding preapical dorsal bristles, no other femoral bristles evident. Inner cross-vein at about two-fifths from apex of discal cell; no appendage on second vein, though there is a slight flexure where such would normally occur indicating the possibility that it may possibly be present in the species.

Length, 6 mm.

Type, Cairns, N. Queensland (J. F. Illingworth).



- Text-figure 1.—Antenna of *Campylocera hyalipennis*.  
 Text-figure 2.—Wing of *Neotoxura discoidalis*.  
 Text-figure 3.—Wing of *Toxura maculipennis*.  
 Text-figure 4.—Head of *Epicerella triangularis* from the side.  
 Text-figure 5.—Apex of wing of same.  
 Text-figure 6.—Head of *Epicerella multipunctata* from the side.  
 Text-figure 7.—Wing of same.

*EPICERELLA MULTIPUNCTATA*, n. sp.

Male.—Similar in general appearance to the preceding species, but much darker in colour. Head brownish testaceous, frons with two brownish vittae, broader in front, ocellar triangle not well defined, greyish dusted and not darker than the ground colour of frons; antennae fuscous; face with the linear portion of the carina, and a mark on each side of the lower wide portion of same, fuscous; a dark spot opposite base of third antennal segment on parafacial; palpi brown. Thorax darker than head, the dorsum grey dusted and with four broad fuscous vittae, scutellum brown on disc; pleura largely infuscated. Abdomen variable in colour, sometimes (type) almost entirely fuscous. Legs brownish testaceous, apices of femora more or less darkened, especially on the under side. Wings with many clear dots on a brown ground.

Head in profile as Text-fig. 6; verticals as in *triangularis*, postverticals much stronger than in that species, no fine hair behind the single strong orbital; third antennal segment tapered to apex. Thorax as in *triangularis*, but with only one pair of strong postsutural dorsocentral bristles; the centre of propleura with more numerous bristles, and the mesopleura with two closely placed strong bristles on hind margin, instead of but one. Legs rather stout, fore femur with a few short posteroventral bristles, hind femur with two or three preapical dorsal bristles and a few shorter preapical anteroventral bristles. Venation of apical section of wing as in Text-fig. 7, the appendage to second vein quite prominent.

Length, 6-7 mm.

Type, Cairns, N. Queensland; paratype, Gordonvale, N. Queensland (J. F. Illingworth).

The paratype is much paler in colour than the type, and the frontal triangle is considerably shorter, but I can detect no other distinctions between the specimens and consider they belong to the same species.

The next two genera are not referable to Toxurini, nor are they properly placed in the family Pyrgotidae in my opinion, though there are characters which appear to indicate the possibility of their being intermediate forms. Unfortunately hard and fast rules for the differentiation of the families seem impossible of attainment and further material may yet prove or disprove the correctness of my present alignments.

#### MAENOMENUS Bezzi.

This genus is a difficult one to assign satisfactorily to a family, but despite the similarity in the sheath of the ovipositor to those of certain Pyrgotidae I am convinced that it is not referable to that family. The carinate face, cleft third antennal segment, and presence of a mid coxal prong, combine to place it in the Ortalidae, with the bulk of evidence indicating its position in Platystominae. There is, however, plenty of latitude for a difference of opinion as to the limits of the Ortalidae and especially as to the contained subfamilies, and while I do not accept the genus as belonging to the Pyrgotidae, I am not committed to the opinion that it is referable to Platystominae. In any of the accepted families the genus is abnormal.

I figure the head (Text-fig. 8), and the wing (Text-fig. 9) to facilitate identification.

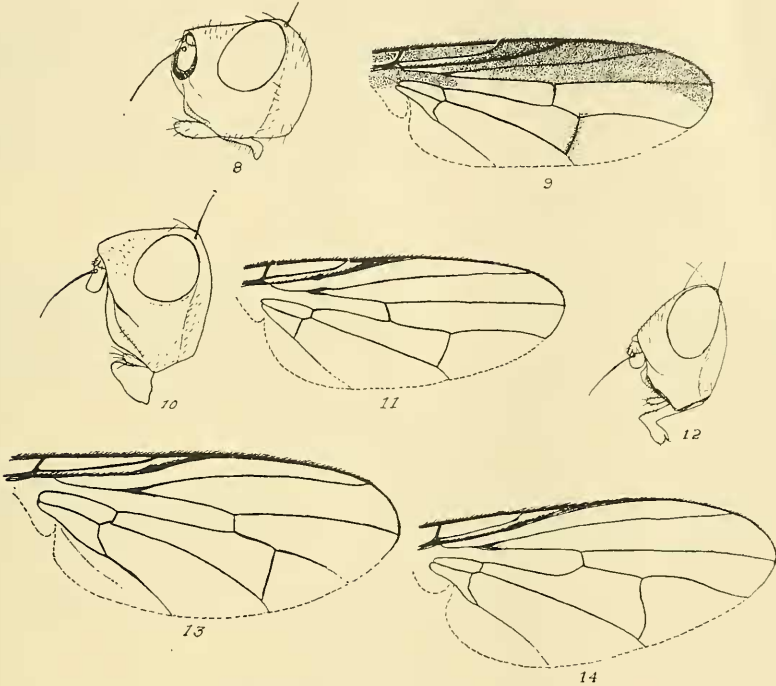
#### FRONTALIA, n. gen.

This genus also is a rather aberrant one, possessing practically all the characters of Pyrgotidae except the simple second antennal segment and the angulation of the vein closing the anal cell of the wing. The mid coxal prong is lacking in this genus and present in *Maenomenus*.

Head in profile as in Text-fig. 10; frons about three times as wide as one eye and fully as wide as long, inner verticals present, erect, longer than the other bristles, outer verticals lacking; postverticals rather widely separated, directed forward and outward, one bristle on each orbit which is situated at about its own length from eye and directed outward (in type); face with a sharp central carina, space between facial ridges at angles not more than half as great as that from either to eye; second antennal segment cleft, on inner side almost as long as third segment, but distinctly shorter than it on outer side; palpi

slender. Thorax as in *Pyrgota*; notopleurals 1 + 1, two pairs of postsutural dorsocentrals present, the anterior pair short, the posterior pair proximad of the pair of moderately long prescutellar acrostichals; scutellum bare on disc. Wing-venation as Text-fig. 11.

Genotype, the following species.



Text-figure 8.—Head of *Maenomenus ensifer* from the side.

Text-figure 9.—Wing of same.

Text-figure 10.—Head of *Frontalia genalis* from the side.

Text-figure 11.—Wing of same.

Text-figure 12.—Head of *Prodalmania variabilis* from the side.

Text-figure 13.—Wing of *Campylocera hyalipeennis*.

Text-figure 14.—Wing of *Nicholsonia curvinervis*.

#### FRONTALIA GENALIS, n. sp.

Male.—Head rufous yellow, vertex and occiput more brownish, third antennal segment, arista, and apices of palpi, fuscous. Thorax brownish-red, dorsum with slight grey dust, and traces of four pale vittae separated by darker lines. Abdomen brownish-black, slightly shining, and with faint pale dust on dorsum. Legs coloured as thorax, apices of femora darker. Wings hyaline, veins yellow. Halteres dull yellowish-brown.

Frons with microscopic hairs, those on sides of occiput longer, but inconspicuous. Thoracic dorsum with rather dense, short, stiff, decumbent, black hairs; scutellum subtriangular, convex, with four equal bristles. Abdomen short and stout, basal tergite not much longer than second. Legs stout, no bristles present.

Third wing vein bare at base, costa with a slight indication of a break at apex of subcosta.

Length, 4.5 mm.

Type, Glen Forest, Darling Range, W.A., 11.9.1926. No collector's name on the label.

#### PRODALMANNIA Bezzi.

This genus would, in my opinion, fall close to the foregoing one, but it is very different in the structure of the head. Dr. Bezzi refers to its resemblance to certain Conopidae and the generic name is proposed with this resemblance in mind, *Dalmannia* being a genus of that family.

I figure the head of *Prodalmania variabilis* Bezzi (Text-fig. 12), and add to the records the occurrence of three males at Sydney, 30.11.1924, submitted to me by Dr. E. W. Ferguson.

#### Family Pyrgotidae.

Of the genera which are in the main part of this paper, only *Campylocera* Macquart and *Adapsilia* Waga are referable to Pyrgotidae in my opinion. The genus *Nicholsonia* proposed herein for the reception of *Campylocera curvinervis* Bezzi belongs also to this family. All three are represented by single species in the material now before me, but possibly more species occur in Australia.

I figure certain characters of two of the included species.

#### CAMPYLOCERA Macquart.

The single Australian species which I place in this genus is very similar to the African species *oculata* Hendel and *latigenis* Hendel, but differs from both in the structure of the head and the sheath of the ovipositor.

The genus is well represented in Africa and species have been described from the Orient, the most recent one being *hirsuta* Aldrich, an Indian species reared from beetles of the genus *Adoretus* (Rutelinae).

#### CAMPYLOCERA HYALIPENNIS, n. sp.

Female.—Shining testaceous yellow, the abdomen more orange-yellow, and the mesonotum with three reddish vittae; all tibiae browned. Wings greyish hyaline, veins brownish-yellow, almost imperceptibly darker at base of third vein and on inner cross-vein.

Frons about one-third of the head width; face below antennae about half as wide as eye at same point; parafacial at base of antenna as wide as third antennal segment, gradually becoming narrower below, quite narrow at lower level of eye; cheeks not as high as width of third antennal segment, with a dark mark below eye; second and third antennal segments about equal in length on upper margins, third almost twice as long as second on lower margin; arista longer than antenna; frons haired in front, one or two fine short hair-like bristles on upper part of each orbit; inner verticals and the postverticals the best developed of the cephalic bristles. Thoracic bristles weak, the hairs erect and numerous; anterior notopleural minute, posterior one distinct, only one pair of dorsocentrals developed, no acrostichals, two postalars, one supra-alar, and no humeral; propleural and prosternal hairs long; scutellum with some discal hairs and four marginal bristles. Sheath of ovipositor longer than remainder of abdomen, swollen on basal fourth, beyond that forming an almost parallel-sided

cylinder which is slightly tapered at apex, the surface with rather dense fine erect hairs of moderate length. Legs normal, all femora with some fine hair-like ventral bristles, one at base of each much longer than the others. Venation as in Text-fig. 13.

Length, 10 mm.

Type, Cairns, N. Queensland (J. F. Illingworth).

This species is distinguished from *brevicornis* Hendel, a New Guinea species, by the narrow cheek, and the lack of markings on the wings. The wing in the type specimen in certain lights and against a white background shows a very faint grey shade over the entire apex beyond the outer cross-vein, and at level of the stigma there is a similar faint cloud, which it is possible in other specimens may be even more distinct.

Type in United States National Museum.

#### NICHOLSONIA, n. gen.

This genus is readily distinguished from its allies by the characters noted in the foregoing key to genera. Wing venation as in Text-fig. 14.

Genotype, *Campylocera curvinervis* Bezzi.

This genus is dedicated to Mr. A. J. Nicholson who collected much of the material which formed the basis of my papers on Australian Diptera.

#### ADAPSILIA Waga.

#### ADAPSILIA ILLINGWORTHANA Bezzi.

I have before me an additional male of this species which bears a label similar to that of the type specimen. The specimen belongs to the United States National Museum collection.

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